

We claim:

1. A modular refrigeration unit for use in a refrigeration cabinet, the modular refrigeration unit having:
  - a condenser assembly including:
    - a condenser, for condensing a refrigerant therein;
    - a condenser fan, for directing a flow of air through the condenser, to remove heat from the condenser;
    - a condenser fan motor to drive the condenser fan;
    - a compressor for compressing the refrigerant;
  - an evaporator assembly, including:
    - an evaporator, for evaporating the refrigerant therein;
    - an evaporator tray positioned beneath the evaporator for collecting moisture condensed thereon;
    - an evaporator fan for directing a flow of air through the evaporator;
    - an evaporator fan motor to drive the evaporator fan;
  - the condenser assembly including a condenser tray for collecting and dissipating moisture condensed on the evaporator and directed to the condenser tray;
  - a bulkhead assembly positioned between the condenser assembly and the evaporator assembly;
  - the refrigeration cabinet including a condenser chamber adapted for receiving the condenser assembly, the condenser chamber having at least one insulated wall portion with at least one mating surface thereon, and an insulated main chamber, in which air is cooled by the evaporator assembly; and
  - the bulkhead assembly being engageable with said at least one mating surface to form a substantially air-tight seal between the condenser chamber and the main chamber.

2. A modular refrigeration unit according to claim 1 in which the bulkhead assembly includes a bulkhead body portion and a gasket assembly positioned around a periphery of the bulkhead body portion, the gasket assembly being adapted for engaging with said at least one mating surface to seal the condenser chamber from the main chamber.
3. A modular refrigeration unit according to claim 2 in which the gasket assembly includes a gasket portion and a thermal breaker portion, the thermal breaker portion being mounted on the periphery of the bulkhead body portion.
4. A modular refrigeration unit according to claim 2 in which the gasket portion comprises at least three flexible vanes protruding outwardly from the periphery and adapted to engage with said at least one mating surface to form a substantially air-tight seal.
5. A modular refrigeration unit according to claim 4 in which the vanes comprise rubber.
6. A modular refrigeration unit according to claim 1 in which the condenser fan is positioned for creating a flow of air into the condenser chamber in a predetermined direction towards the condenser and the compressor, to cool the condenser and the compressor.
7. A modular refrigeration unit according to claim 6 in which the predetermined direction of said air flow directed towards the condenser and the compressor is substantially parallel to the bulkhead body portion.

8. A refrigerator including:

a refrigeration cabinet having insulated outer walls and at least one access door for accessing an insulated main chamber of the cabinet;

the refrigeration cabinet including a condenser chamber extending inwardly from an aperture in an outer wall of the cabinet, the condenser chamber being at least partially defined by at least one insulated interior wall portion with at least one mating surface thereon, said at least one mating surface being positioned distal to the aperture;

a modular refrigeration unit installed in the cabinet, the modular refrigeration unit having:

a condenser assembly, including:

a condenser for condensing a refrigerant therein;

a condenser fan, for directing a flow of air through the condenser, to remove heat from the condenser;

a condenser fan motor to drive the condenser fan;

a compressor for compressing the refrigerant;

an evaporator assembly, including:

an evaporator, for evaporating the refrigerant therein;

an evaporator tray positioned beneath the evaporator, for collecting condensed moisture;

an evaporator fan for directing a flow of air through the evaporator;

an evaporator fan motor to drive the evaporator fan;

the condenser assembly including a condenser tray for collecting and dissipating moisture condensed on the evaporator and directed to the condenser tray;

a bulkhead assembly positioned between the condenser assembly and the evaporator assembly; and

the bulkhead assembly being engageable with said at least one mating surface to form a substantially air-tight seal, whereby the condenser assembly is substantially insulated from the main chamber.

9. A refrigerator according to claim 8 additionally including:
  - an evaporator shield assembly positioned in the main chamber for channelling a circulatory air flow in the main chamber through the evaporator;
  - a plenum positioned adjacent to the evaporator, for guiding the circulatory air flow along a predetermined circulatory air flow path; and
  - a partition positioned substantially vertically in the main chamber for directing at least a portion of the circulatory air flow toward the evaporator.
10. A refrigerator according to claim 9 in which the plenum and the partition partially define an interior chamber portion of the main chamber, the plenum and the partition including a plurality of openings formed to direct a predetermined volume of air following the circulatory air flow path into the interior chamber portion.
11. A refrigerator in which the insulated interior wall portion extends from the aperture in the outer wall to said at least one mating surface to form a condenser chamber floor on which the modular refrigeration unit is positioned.
12. A refrigerator in which the insulated interior wall portion extends from the aperture in the outer wall to said at least one mating surface to form a condenser chamber ceiling disposed above the modular refrigeration unit.

13. A refrigerator according to claim 8 in which said at least one mating surface is a thermal breaker.
14. A refrigerator according to claim 13 in which the thermal breaker forms a peripheral ledge positioned to engage the bulkhead assembly to form an air-tight seal.
15. A refrigerator according to claim 8 in which the bulkhead assembly includes a bulkhead body portion and a gasket assembly positioned on a periphery around the bulkhead body portion, the gasket assembly being adapted to engage with said at least one mating surface to form a substantially air-tight seal between the condenser chamber and the main chamber.
16. A refrigerator according to claim 15 in which the gasket assembly includes a gasket portion and a thermal breaker portion attached to each other.
17. A refrigerator according to claim 16 in which the thermal breaker portion is mounted on the bulkhead body portion.
18. A refrigerator according to claim 16 in which the thermal breaker portion is embedded in the bulkhead body portion.
19. A refrigerator according to claim 11 in which the aperture in the outer wall of the refrigeration cabinet extends above the condenser assembly, such that the flow of air directed through the condenser chamber flows towards the condenser and the compressor in a predetermined path.
20. A refrigerator according to claim 19 in which the refrigeration cabinet includes a grille positioned above the condenser chamber, the grille including a first set of louvers positioned to guide the flow of air into the

condenser chamber from the ambient atmosphere in the predetermined path, and a second set of louvers positioned to guide the flow of air out of the condenser chamber in the predetermined path.

21. A refrigerator according to claim 8 in which the refrigeration cabinet includes a secondary access door positioned in a substantially planar second outer wall of the cabinet for accessing the main chamber, the secondary access door being movable between an open position and a closed position, the second outer wall of the cabinet including an opening for receiving the secondary access door such that, when the secondary access door is in the closed position, an exterior surface of the secondary access door is substantially flush with an external surface of the second outer wall.
22. A refrigerator according to claim 21 in which the second outer wall includes a ridge projecting into the opening, the ridge being spaced back from the external surface of the second outer wall to permit the exterior surface of the secondary access door to be substantially flush with the external surface of the second outer wall when the secondary access door is in the closed position.
23. A refrigerator according to claim 22 in which the second outer wall has a predetermined thickness of insulation therein and the secondary access door has a thickness of insulation substantially equivalent thereto, for insulating the main chamber from the ambient atmosphere.
24. A gasket assembly for use with a mating surface including a first thermal breaker portion in a refrigeration cabinet, the gasket assembly including:
  - a second thermal breaker portion adapted for attachment to a bulkhead body portion around a peripheral edge thereof; and

a flexible gasket portion attached to the second thermal breaker portion, the gasket portion being adapted to engage with the mating surface on at least one internal wall portion surface of the refrigeration cabinet to form a substantially air-tight seal.